BOGOYAVLENSKAYA, R.A.

Specialization of the species Puccinia glumarum (Schmidt) Eriks. et Henn. Bot. zhur. 47 no.8:1197-1201 Ag '62. (MIRA 15:10)

1. Institut lesa i drevesiny Sibirskogo otdeleniya AN SSSR, Krasnoyarsk.

(Stripe rust)

BOGOYAVLENSKAYA, R.A.

Expediency of quarantining the disease caused by Phoma tuberosa. Zashch.rast.ot vred. i bol. 4 no.4:47-48 Jl-Ag '59. (MIRA 16:5)

1. Zaveduyushchaya otdelom zashchity rasteniy Dal'nevostochnogo nauchno-issledovatel'skogo instituta sel'skogo khozyaystva.
(Potatoes-- Diseases and pests) (Phoma)

BOGOYAVLENSKAYA, R.A., kand.biolog.nauk

Decreasing the susceptibility of potatoes to potato late blight. Zashch.rast.ot vred.i bol. 5 no.7:21-23 Jl '60. (MIRA 16:1)

1. Zaveduyushchaya otdelom zashchity rasteniy Dal'nevostochnogo nauchno-issledovatel'skogo instituta sel'skogo khozyaystva, Khabarovsk.

(Soviet Far East—Potato Rot)

BOGOYAVLENSKAYA, R.A.

Fungi parasitizing on needles of the Siberian fir. Izv. SO AN SSSR no.4. Ser. Biol.-med. nauk no.1:78-80'63. (MIRA 16:8)

(KOZUL'KA DISTRICT--FUNGI, PHYTOPATHOGENIC)
(KOZUL'KA DISTRICT--FIR--DISEASES AND PESTS)

BOGOYAVLENSKAYA, R.A.

Susceptibility of Siberian fir to cellulose-decomposing fungi in the Bol'shoy Kemchug basin. Izv. SO AN SSSR no.12: Ser. biol.-med. nauk no.3:96-100 '64. (MIRA 18:6)

1. Institut lesa i drevesiny Sibirskogo otdeleniya AN SSSR, Krasnoyarsk.

KHARIN, N.G.; BOGOYAVLENSKAYA, R.A.; KOLOVSKIY, R.A.

Phytopathology, spectrophotometry and aerial photography. Nauch. dokl.vys.shkoly; biol.nauki no.3:111-117 '65.
(MIRA 18:8)

1. Rekomendovana Institutom lesa i drevesiny Sibirskogo otdeleniya AN SSSR.

USSR/Soil Science - Organic Fertilizers. J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86808

Author : Bogoyavlenskaya, R.O.

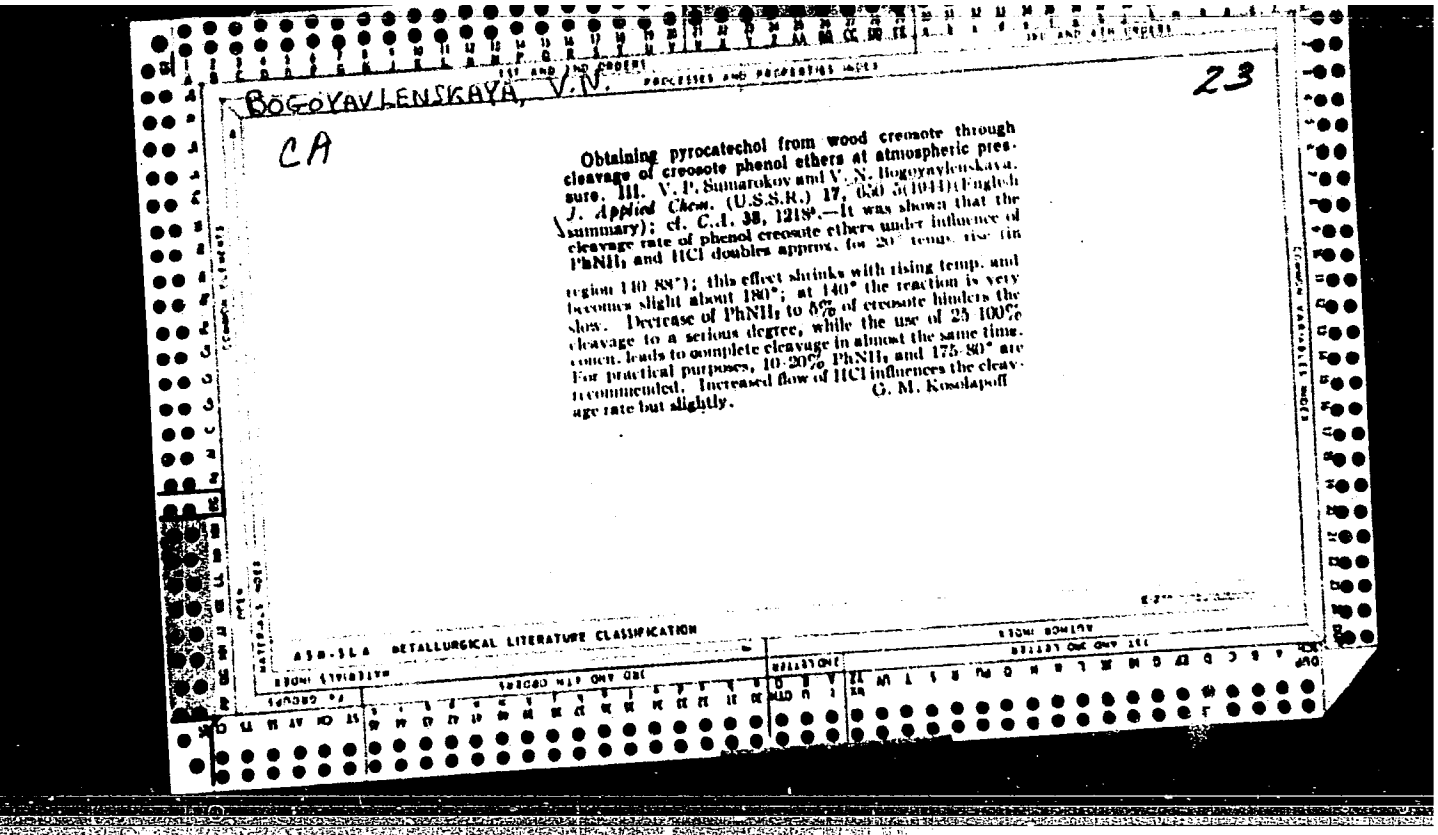
Inst : Smolensk State Agric. Experimental Station

Title : Organic Mineral Mixtures.

Orig Pub : Byul. nauchno-tekhn. inform. Smolenskoy gos. s.-kh. opytn. st., 1957, No 1, 4-8

Abstract : The result are described (without indicating the experimental conditions) of the testing of organic mineral mixtures under various crops and the conclusion is drawn that organic phosphate neutralized mixtures "in large and small doses" have the advantage, acting better in Smolenskaya Oblast in the more cultivated soils.

Card 1/1



BOGOYAVLENSKAYA, V.V.

23

CA

Obtaining pyrocatechol from wood creosote through cleavage of creosote phenol ethers at atmospheric pressure. III. V. P. Samarukov and V. N. Bogoyavlenskaya. *J. Applied Chem.* (U.S.S.R.) 17, 650-3(1944)(English summary); cf. C.A. 38, 1218⁹.—It was shown that the cleavage rate of phenol creosote ethers under influence of $PhNH_2$ and HCl doubles approx. for 20° temp. rise (in region 140-80°); this effect shrinks with rising temp. and becomes slight about 180°; at 140° the reaction is very slow. Decrease of $PhNH_2$ to 6% of creosote hinders the cleavage to a serious degree, while the use of 25-100% concn. leads to complete cleavage in almost the same time. For practical purposes, 10-20% $PhNH_2$ and 175-80° are recommended. Increased flow of HCl influences the cleavage rate but slightly.

G. M. Kosolapoff

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

FEFILOV, V.V.; CHISTOV, I.F.; BOGOYAVLENSKAYA, V.N.; Prinimali uchastiye: POPOV, G.A., rabotnik; LARINA, Ye.M., rabotnitsa; MAKLOVA, A.F., rabotnitsa

Utilization of white pigment and sewage waters of the Dmitriyevsk Wood Chemical Plant. Sbor.trud.TSNILKHI no.14: 60-73 '61. (MIRA 16:4)

1. Dmitriyevskiy lesokhimicheskiy zavod (for Popov, Larina, Maklova).
(Makeyevka--Wood using industries--By-products)
(Fertilizers)

BOGOYAVLENSKAYA, Zoya Vasil'yevna; USATYUK, M.K., red.; SHVETSOV, V.G., red.izd-va; SOTNIKOVA, N.F., tekhn. red.

[Purchase and processing of wild fruit and berries]Zakupka i pererabotka dikorastushchikh plodov i iagod. Moskva, Izd-vo TSentrosoiuza, 1962. 82 p. (MIRA 16:3)
(Canning and preserving)

BOGOYAVLENSKIY, A.; VEDERNIKOV, A. (g. Kazan')

Crystalline scale. Khim. v shkole 14 no.1:85 Ja-F '59. (MIRA 12:2)

(Gypsum)

BOGYAVLENSKIY A.A.

AID P - 922

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 13/22

Authors : Bogyavlenskiy, A. A. and Umova, L. N.

Title : Positive difference effect

Periodical : Zhur. prikl. khim., 27, no. 5, 548-551, 1954

Abstract : The relation of the difference effect to the concentration of the electrolyte, to electrode surfaces, and to distances between the electrodes is studied. Three diagrams, 3 references (Russian: 1935-1945).

Institution : None

Submitted : Je 7, 1952

BOGOYAVLENSKIY, A. A. Cand. Physicomath Sci.

Dissertation: "Certain Necessary Conditions for Existence of Simple Solutions in the Problem on Motion of a Heavy Solid Around a Fixed Point."

18/5/50
Inst. Of Mechanics, Acad. Sci. USSR

SO Vecheryaya Moskva
Sum 71

BOGOYAVLENSKIY, A.A. (Moskva)

A form of the generalized integral of areas. Prikl.mat. i mekh. 21 no.3:422-423 My-Je '57. (MIRA 10:10)
(Integrals, Generalized)

BOGOYAVLENSKIY, A.A. (Moskva)

Special cases of motion of a heavy solid body around a fixed point.
Prikl.mat. i mekh. 22 no.5:622-645 S-O '58. (MIRA 11:11)
(Motion)

BOGOYAVLENSKIY, A.A. (Moskva)

Certain special solutions of the motion problem of a heavy solid body around a fixed point. Prikl.mat. i mekh. 22 no.6:738-749 N-D '58. (MIRA 11:12)
(Motion)

26138
S/040/61/025/005/017/021
D274/D306

16.2000

AUTHOR: Bogoyavlenskiy, A.A. (Moscow)

TITLE: Cyclical permutations for a generalized integral of areas

PERIODICAL: Prikladnaya matematika i mekhanika, v. 25, no. 4, 1961, 774-777

TEXT: The most typical generalized are-integrals are given in paragraphs 1, 2, 4 of S.A. Chaplygin (Ref. 1: O nekotorom vozmozhnom obobshchenii teoremy ploshchadey s prilozheniyem k zadache o katanii sharov. Sob. soch., v. 1, Gostekhizdat, 1948, pp 26-56). It can be shown that these integrals are integrals of cyclical permutations according to Chetayev (Ref. 2: Ob uravneniyakh Puankare. PMM, 1941, v. 5, no 2, 253-262). Below, the notations and definitions given by Chaplygin are adopted. On paragraph 1 of Ref. 1 (Op. cit) the position of a mechanical system is given (according to Poincaré-Chetayev) by the dependent variables

$$\alpha, \beta, \gamma, \beta_i^k, x', y', z', \quad (i,k = 1,2) \qquad (1)$$

Card 1/4

Cyclical permutations...

where β_i^k are the cosines of the angles between the axes Axyz and Ax'y'z' whose z'-axis coincides with Az, the second system being rotated about that axis by an angle $\delta\theta$. The subscripts refer to the xyz system, and the superscripts - to the x'y'z' system. The variation of an arbitrary function f of variables (1) on a virtual displacement is defined:

$$\delta f = \sum_{j=1}^{4} \omega_j X_j f + \Sigma \omega_\nu X_\nu f$$

The parameters of the virtual displacements are

$\omega_1 = \delta\alpha$, $\omega_2 = \delta\beta$, $\omega_3 = \delta\gamma$, $\omega_4 = \delta\theta$, ω_ν $(\nu = 5,6,\ldots)$

and the corresponding operators

$$X_1 = \frac{\partial}{\partial\alpha}, \quad X_2 = \frac{\partial}{\partial\beta}, \quad X_3 = \frac{\partial}{\partial\gamma}, \quad X_4 = \sum_{i=1}^{2}\left(\beta_i^2 \frac{\partial}{\partial\beta_i^1} - \beta_i^1 \frac{\partial}{\partial\beta_i^2}\right),$$

X_ν $(\nu = 5,6\ldots)$

The operators X do not depend on the variables α, β, γ, β_i^k; they

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S/040/61/025/004/017/021
D274/D306

Cyclical permutations...

constitute a subgroup of relative displacements. The virtual displacements constitute an Abelian group. The expressions $X_4(T) = 0$ and $X_4(U) = 0$ hold; the displacement X_4 is a cyclical permutation according to Chetayev; to it corresponds the first Chaplygin-integral (2) of (Ref. 1: Op. Cit), $\frac{\partial L}{\partial \eta_4} = \text{const}$. To paragraph 2 of Ref. 1 (Op. cit), the position of the system is defined by

$$\alpha, \beta, \gamma, \alpha', \beta', \gamma', \beta_1^k, \alpha_1^k, x_1', y_1', z_1', x_2', y_2', z_2' \quad (3)$$

The variation of the function f, the parameters ω, and the operators X are defined. Again, the operators constitute a subgroup, and the virtual displacements - an Abelian group. $X_7(T + U) = 0$; X_7 is a cyclical permutation according to Chetayev; to it corresponds Chaplygin's integral $S + kS' = \text{const}$. On paragraph 4 of Ref. 1 (Op. cit), the results of that section were extended by Bogoyavlenskiy, in the sense that the integral was found for other forces and constraints. The cyclical permutations are found for the new conditions. The obtained operators X constitute a subgroup, and the virtual displacements - an Abelian group. $X_4 (T + U) = 0$; X_4 is a

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S/040/61/025/004/017/021
D274/D306

Cyclical permutations...

cyclical permutation according to Chetayev; to it corresponds Chaplygin's integral (11) and (5) of Ref. 1 (Op. cit). There are 3 Soviet-bloc references.

SUBMITTED: May 8, 1961

Card 4/4

BOGOYAVLENSKY, A.A. (Moscow)

"Integrals of cyclic displacements for some mechanical systems"

report presented at the 2nd All-Union Congress on Theoretical and Applied Mechanics, Moscow, 29 January - 5 February 1964

ACCESSION NR: AP4027594 S/0040/64/028/002/0360/0363

AUTHOR: Bogoyavlenskiy, A. A. (Moscow)

TITLE: Linear integral of cyclic perturbation for a solid body with an interior movable mass

SOURCE: Prikladnaya matematika i mekhanika, v. 28, no. 2, 1964, 360-363

TOPIC TAGS: linear integral, cyclic perturbation, mechanical system, first integral, Lie group, infinitesimal transformation, group operator, commutative operator, Lagrange coordinate, Lagrange-Rauss method

ABSTRACT: Knowledge of the cyclic perturbation of a mechanical system makes it possible to find the first integrals. This circumstance may make it possible to integrate the equations of motion or at least to lower their order. For finding cyclic perturbation, it is necessary to consider a Lie group of infinitesimal transformations such that at least one (in the best case all) operator of the group be permuted (commutative) with all the other operators. The attractiveness of the Lie group theory method for finding first integrals is its advantage over the Lagrange-Rauss method in allowing the study of more structurally complex

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ACCESSION NR: AP4027594

perturbations of a mechanical system than perturbations described by the usual Lagrange coordinates. Such cyclic perturbations, on the other hand, simplify the matter, making it possible to find first integrals. It is natural that perturbations referred to Lagrange coordinates are a special case of perturbations described by operators of a group. The results obtained by the author can be used with the above parameters of possible perturbations, taking Euler angles for the Poincare variables. Orig. art. has: 15 formulas.

ASSOCIATION: none

SUBMITTED: 14Dec63 DATE ACQ: 28Apr64 ENCL: 00

SUB CODE: MM NO REF SOV: 006 OTHER: 002

Card 2/2

ACCESSION NR: AP4040575 S/0040/64/028/003/0508/0510

AUTHOR: Bogoyavlenskiy, A. A. (Moscow)

TITLE: Linear integral of cyclic motion for a gyroscope in a Cardan suspension

SOURCE: Prikladnaya matematika i mekahnika, v. 28, no. 3, 1964, 508-510

TOPIC TAGS: gyroscope, gyroscope suspension, Cardan suspension, gyroscope analysis, gyroscope motion equation, first integral

ABSTRACT: The first integrals of the equation of motion for a gyroscope in a Cardan suspension are found by considering the cyclic motion. The coordinates for the system are shown in Fig. 1 on the Enclosure. The outer ring of the Cardan suspension is free to rotate about the z_1 axis of the fixed coordinate system $Ox_1y_1z_1$, the angular velocity being ψ'. In the moving coordinate system Oxyz, x is the axis of rotation of the case (inner ring of the suspension) whose angular velocity in the outer ring is θ'. The z axis is the axis of symmetry of the gyroscope whose angular velocity relative to the case is φ'. $A^\circ, B^\circ, C^\circ$ are the principal moments of inertia of the case, $\overline{A, B = A, C}$ are those of the gyroscope, and I is the moment of inertia of the outer ring about the z_1 axis. The centers

Card 1/4

of gravity of the case and the gyroscope are point O. Infinitesimal operators of the real motion are constructed for use in finding the integral of the cyclic motion. It has previously been shown that two of these operators are cyclic. From the cyclic property of one it follows that

$$a\frac{\partial U}{\partial \psi} - b\frac{\partial U}{\partial \varphi} = 0 \quad ,$$

where U is the potential describing the effective forces acting on the system (the friction in the bearings being neglected) and $(a = \text{const} \neq 0, \quad b = \text{const} \neq 0)$. Then $a\left[(I + C^\circ + (A + B^\circ - C^\circ)\sin^2\theta]\psi' + Cr\cos\theta\right) - bCr = \text{const}$, where $r = \varphi' + \psi'\cos\theta$ is the z component of the instantaneous angular velocity of the gyroscope. Similarly, from the cyclic property of the second operator

$$a\frac{\partial U}{\partial \psi} + b\frac{\partial U}{\partial \varphi} = 0$$

and $a\left[(I + C^\circ + (A + B^\circ - C^\circ)\sin^2\theta]\psi' + Cr\cos\theta\right) + bCr = \text{const}$. In addition, the kinetic energy of the system is given by $2T = [I + C^\circ + (A + B^\circ - C^\circ)\sin^2\theta]\psi'^2 + (A + A^\circ)\theta'^2 + C(\varphi' + \psi'\cos\theta)^2 = 2U + h$. Orig. art. has: 52 equations and 1 diagram.

ASSOCIATION: none

ACCESSION NR: AP4040575

SUBMITTED: 24Jan64 DATE ACQ: 19Jun64 ENCL: 01

SUB CODE: GP NO REF SOV: 005 OTHER: 001

Card 3/4

ACCESSION NR: AP4040575

ENCLOSURE: 01

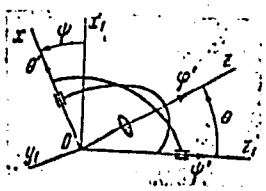

Fig. 1. Coordinate systems for a gyroscope in a Cardan suspension

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L 65087-65 EWT(d)/FSS-2/EED(k)-2/EED-2/EWA(c) BC

ACCESSION NR: AR5019345 UR/0124/65/000/007/A008/A008

SOURCE: Ref. zh. Mekhanika, Abs. 7A62

AUTHOR: Bogoyavlenskiy, A. A. 14 D

TITLE: Generalized cyclic drifts of a Cardan joint gyroscope in a particular case of motion 9

CITED SOURCE: Tr. Mezhvuz. konferentsii po prikl. teorii ustoychivosti dvizheniya i analit. mekhan., 1962. Kazan', 1964, 38-44

TOPIC TAGS: Cardan joint gyro, gyro drift, gyro motion, partial solution approach

TRANSLATION: The author illustrates a partial solution to a problem on the motion of a heavy symmetric Cardan joint gyro with a horizontal axis of the outer ring. The solution in question was obtained previously by the author with a different approach (Prikl. matem. i mekhan., 1959, 23, No. 5, 958-960; RZhMekh, 1960, 9793). P. V. Kharlamov.

SUB CODE: NG ENCL: 00

MLR

Card 1/1

AMINOV, M.Sh., red.; BOGOYAVLENSKIY, A.A., red.; KALININ, S.V., red.; KUZ'MIN, P A., red.; LUR'YE, A.I., red.; MATROSOV, V.M., red.; RUMYANTSEV, V.V., red.; SRETENSKIY, L.N., red.

[Proceedings of the interuniversity conference on the applied theory of the stability of motion and on analytic mechanics] Trudy Mezhvuzovskoi konferentsii po prikladnoi teorii ustoichivosti dvizheniia i analiticheskoi mekhanike. Kazan', Kazanskii aviatsionnyi in-t, 1964. 144 p. (MIRA 18:12)

1. Mezhvuzovskaya nauchnaya konferentsiya po analiticheskoy mekhanike i ustoychivosti dvizheniya, Kazan, 1962.

BOGOYAVLENSKIY, A.A.

Facies-paleogeographical characteristics of Jurassic formations in the South Tajik Depression. Nauch. trudy TashGU no.256 Geol. nauki no.22:32-40 '64 (MIRA 18:2)

BOGOIAVLENSKIY, A. A.

"Appraisal of Some Tomato Diseases," Zashchita Rastenii ot Vreditelei, vol. 7, no. 1-3, 1930, pp. 173-174. 421 D36

So: SIRA Si 90-53, 15 Dec. 1953

BOGOIAVLENSKIY, A. A.

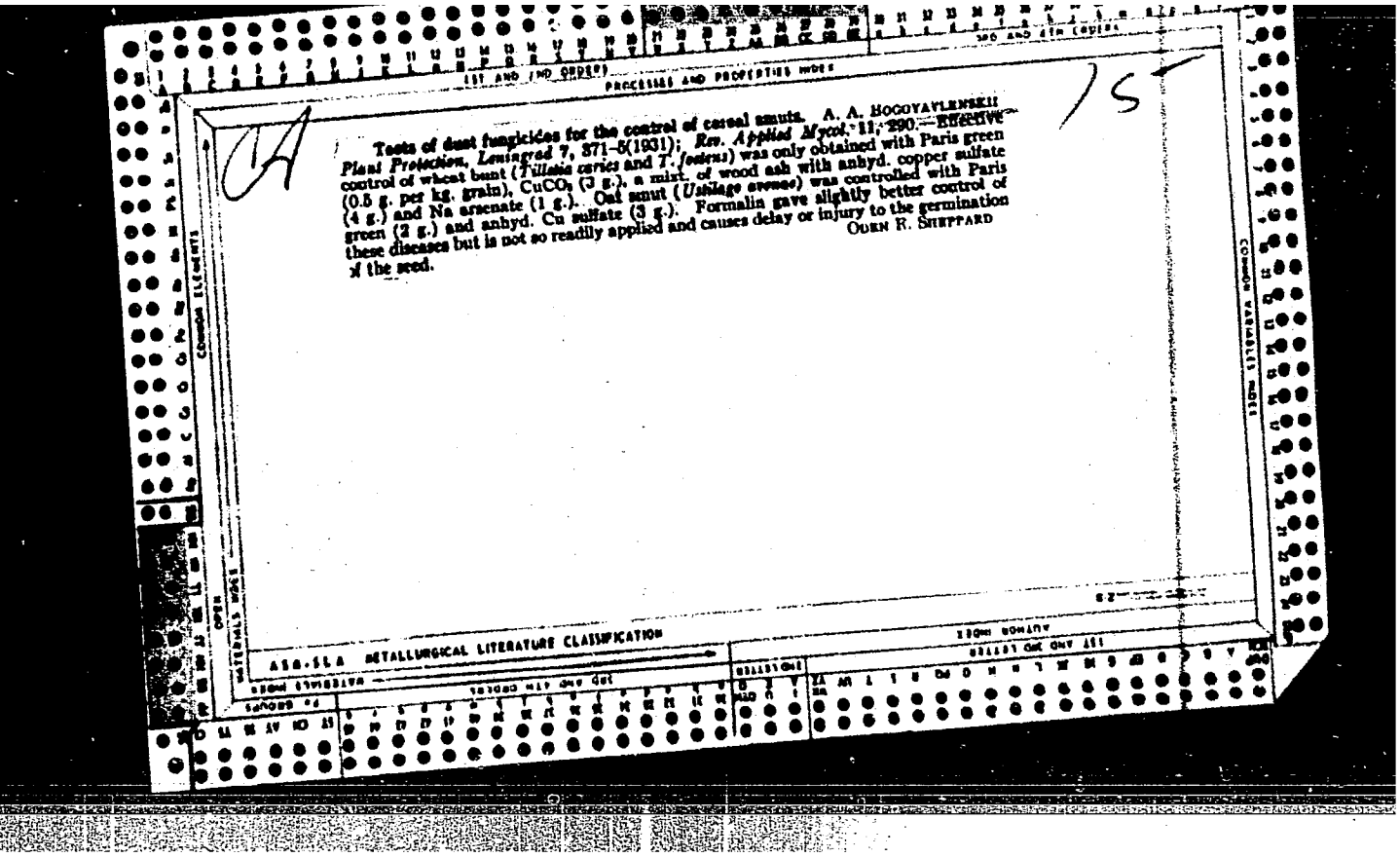
"Variety Testing of Cabbage Seedlings in Regard to Infection with Black Leg," Zashchita Rastenii ot Vreditelei, vol. 7, no. 1-3, 1930, pp. 175-177. 421 D36

So: SIRA Si 90-53, 15 Dec. 1954

BOGOIAVLENSKIY, A. A.

"Effect of the Duration of Formalin Disinfection on the Germination of Wheat, Oats, and Millet Grains," Zashchita Rastenii ot Vreditelei, vol. 7, no. 1-3 1930, pp. 179-180. 421 D36

So: SIRA Si 90-53, 15 Dec. 1953



CA

Tests of dust fungicides for the control of cereal smuts. A. A. Hoggyavlenskii *Plant Protection, Leningrad* 7, 371–8(1931); *Rev. Applied Mycol.* 11, 290.—Effective control of wheat bunt (*Tilletia caries* and *T. foetens*) was only obtained with Paris green (0.5 g. per kg. grain), $CuCO_3$ (3 g.), a mixt. of wood ash with anhyd. copper sulfate (4 g.) and Na arsenate (1 g.). Oat smut (*Ustilago avenae*) was controlled with Paris green (2 g.) and anhyd. Cu sulfate (3 g.). Formalin gave slightly better control of these diseases but is not so readily applied and causes delay or injury to the germination of the seed.

Owen R. Sheppard

1st

Paris yellow from lead nitrates. A. A. Bogoyavlenskii. *Byull. Obmen Opyt. Lakokrasochnoi Prom.* 1930, XII, 19-21.—Paris yellow pigment made from lead nitrates has as good painting properties and superior light stability as the pigment made from Pb acetates. The basicity of the original salt has no influence on the properties of the finished product. [Editor's note: The author gave no proof of his conclusions.] David Aelony

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BOGOIAVLENSKIY, A. A.

"From the Materials on Study of Agricultural Plants of Turkmenia in 1943," Sovetskaia Botanika, no. 3, 1944, pp. 46-47. 450 So S

SO: SIRA SI 90-15: 15 Dec 1953

BOGOYAVLENSKIY, A. A.

"Generalized cyclic displacements for a particular motion of a gyroscope in gymbol suspension"

Report presented at the Conference on Applied Stability-of-Motion Theory and Analytical Mechanics, Kazan Aviation Institute, 6-8 December 1962

1ST AND 2ND ORDERS — PROCESSES AND PROPERTIES INDEX — 3RD AND 4TH ORDERS

Bogojavlenskiy, A.F.

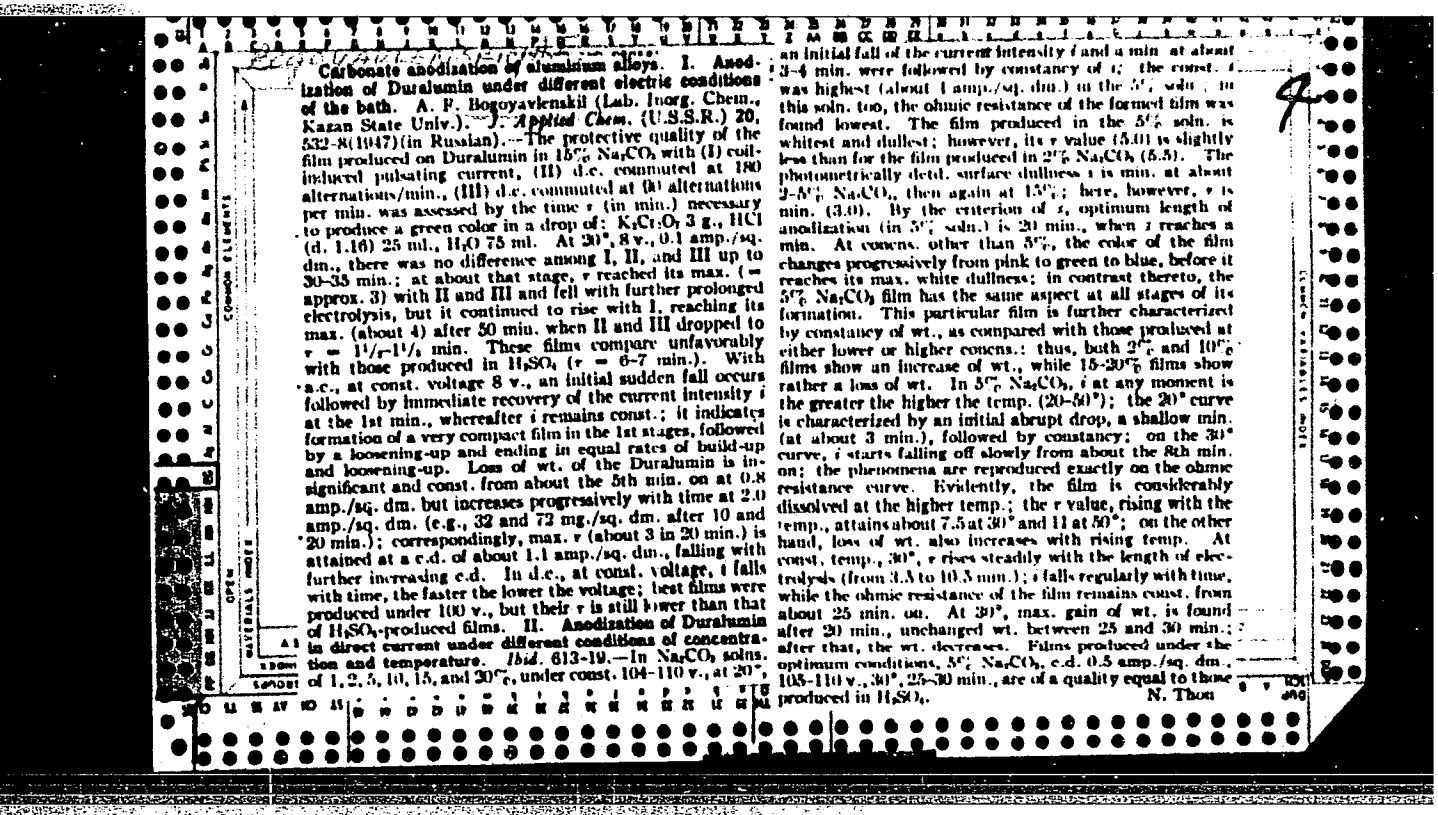
BC

A-1

Taking of samples for study of kinetics of chemical reactions in liquid media. A. F. Bogo-jAVLENSKII. (Zavod. Lab., 1938, 7, 733—734).—The system is distributed amongst a series of Landolt tubes, which are successively removed for analysis.

R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Carbonate anodization of aluminium alloys. I. Anodization of Duralumin under different electric conditions of the bath. A. P. Bogoyavlenskii (Lab. Inorg. Chem., Kazan State Univ.). *Zhur. Prikladnoi Khim. (J. Applied Chem.* (U.S.S.R.) 20, 532-8(1947)(in Russian).—The protective quality of the film produced on Duralumin in 15% Na_2CO_3 with (I) coil-induced pulsating current, (II) d.c. commuted at 180 alternations/min., (III) d.c. commuted at 60 alternations per min. was assessed by the time τ (in min.) necessary to produce a green color in a drop of: $K_2Cr_2O_7$ 3 g., HCl (d. 1.16) 25 ml., H_2O 75 ml. At 20°, 8 v., 0.1 amp./sq. dm., there was no difference among I, II, and III up to 30–35 min.; at about that stage, τ reached its max. (= approx. 3) with II and III and fell with further prolonged electrolysis, but it continued to rise with I, reaching its max. (about 4) after 50 min. when II and III dropped to τ = 1½–1½ min. These films compare unfavorably with those produced in H_2SO_4 (τ = 6–7 min.). With a.c., at const. voltage 8 v., an initial sudden fall occurs followed by immediate recovery of the current intensity i at the 1st min., whereafter i remains const.; it indicates formation of a very compact film in the 1st stages, followed by a loosening-up and ending in equal rates of build-up and loosening-up. Loss of wt. of the Duralumin is insignificant and const. from about the 5th min. on at 0.8 amp./sq. dm. but increases progressively with time at 2.0 amp./sq. dm. (e.g., 32 and 72 mg./sq. dm. after 10 and 20 min.); correspondingly, max. τ (about 3 in 20 min.) is attained at a c.d. of about 1.1 amp./sq. dm., falling with further increasing c.d. In d.c., at const. voltage, i falls with time, the faster the lower the voltage; best films were produced under 100 v., but their τ is still lower than that of H_2SO_4-produced films. **II. Anodization of Duralumin in direct current under different conditions of concentration and temperature.** *Ibid.* 613-19.—In Na_2CO_3 solns. of 1, 2, 5, 10, 15, and 30%, under const. 104–110 v., at 20°, an initial fall of the current intensity i and a min. at about 3–4 min. were followed by constancy of i; the const. i was highest (about 1 amp./sq. dm.) in the 5% soln.; in this soln. too, the ohmic resistance of the formed film was found lowest. The film produced in the 5% soln. is whitest and dullest; however, its τ value (5.0) is slightly less than for the film produced in 2% Na_2CO_3 (5.5). The photometrically detd. surface dullness s is min. at about 2–5% Na_2CO_3, then again at 15%; here, however, τ is min. (3.0). By the criterion of s, optimum length of anodization (in 5% soln.) is 20 min., when s reaches a min. At concns. other than 5%, the color of the film changes progressively from pink to green to blue, before it reaches its max. white dullness; in contrast thereto, the 5% Na_2CO_3 film has the same aspect at all stages of its formation. This particular film is further characterized by constancy of wt., as compared with those produced at either lower or higher concns.: thus, both 2% and 10% films show an increase of wt., while 15–30% films show rather a loss of wt. In 5% Na_2CO_3, i at any moment is the greater the higher the temp. (20–50°); the 20° curve is characterized by an initial abrupt drop, a shallow min. (at about 3 min.), followed by constancy; on the 30° curve, i starts falling off slowly from about the 8th min. on; the phenomena are reproduced exactly on the ohmic resistance curve. Evidently, the film is considerably dissolved at the higher temp.; the τ value, rising with the temp., attains about 7.5 at 30° and 11 at 50°; on the other hand, loss of wt. also increases with rising temp. At const. temp., 30°, τ rises steadily with the length of electrolysis (from 3.5 to 10.5 min.); i falls regularly with time, while the ohmic resistance of the film remains const. from about 25 min. on. At 30°, max. gain of wt. is found after 20 min., unchanged wt. between 25 and 30 min.; after that, the wt. decreases. Films produced under the optimum conditions, 5% Na_2CO_3, c.d. 0.5 amp./sq. dm., 105–110 v., 30°, 25–30 min., are of a quality equal to those produced in H_2SO_4.

N. Thon

CA

2

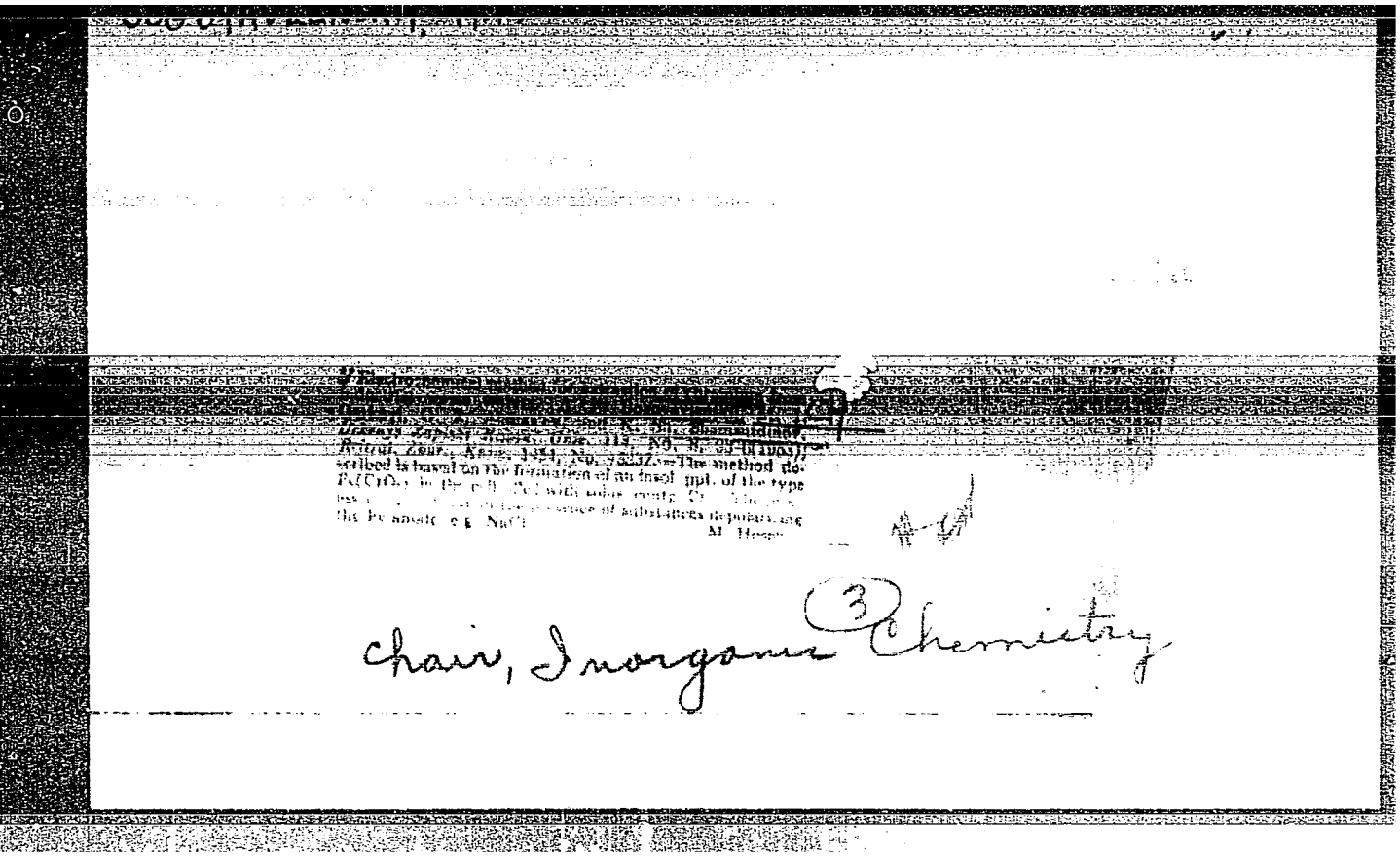
Thixotropic gelation of barium malonate hydrosols in the presence of surface-active substances. A. F. Bogoyavlenskii and M. K. Salikiaa (Univ., Kazan). *Kolloid. Zhur.* 12, 5-8(1950); cf. *C.A.* 44, 2822f.—Gradual addn of MeOH to a satd. aq. soln. of Ba malonate (I) produces first gel flakes, then I crystals, thixotropic gel, and finally unstable gel. Other alcs., fatty acids, Me_2NH, and gelatin (0.01%) have but little effect on this gelation. The yield value of the thixotropic gels (contg. only I, H_2O, and MeOH) detd. with an elastometer of Veller and Rebinder (*C.A.* 40, 5082^9) had a max. (1200 dynes/sq. cm.) at the mol. ratio I:MeOH:H_2O of 1:2000:4000; the yield value of nonthixotropic gels was 600 dynes/sq. cm. J. J. B.

BOGOYAVLENSKIY, A.F.; GERASIMOVA, T.A.

Catalytic activness of the oxide Al_2O_3 formed on the anode. Zhur.prikl.khim. 26 no.11:1122-1126 N '53. (MLRA 6:11)

1. Laboratoriya neorganicheskoy khimii Kazanskogo Gosudarstvennogo universiteta im. V.I.Ul'yanova-Lenina. (Alumina) (Catalysts)

11-53



Chair, Inorganic Chemistry (3)

USSR

"The Positive Difference Effect. A. F. Rozovarlenko and Z. N. Urnova (Zhur. Fiziol. Khim., 1934, 27, (5), 538–551).—[In Russian]. Cf. Tomashev, Zhur. Fiz. Khim., 1938, 12, 413. The positive difference effect, Δv, is the reduction in the action of the weak cathodes of local elements on the introduction of a new strong cathode, and is of interest in studying corrosion processes. R. and U. have determined the values of Δv for short-circuited Zn/Pt couples in HCl soln. Δv (measured as the difference in the vol. of H liberated, in c.c.) varied linearly with the acid concentration (C, the empirical coeff. in the equation $\Delta v = \alpha + \beta C$ being = 0·04 and $\beta = 1·6$ when C was expressed in normalities. Δv also varied linearly with the ratio of cathodic and anodic surfaces ($\Delta v = a + b \cdot S_k/S_a$), provided that $S_k/S_a < 1$; the const. were $a = 0·042$ and $b = 0·093$. a and a are identical and represent the value of Δv in distilled water. A linear relation was not observed with $S_k/S_a < 1$; as the ratio was reduced further Δv increased, then became const. at $S_k/S_a < \frac{1}{4}$. Δv did not depend on the distance between the electrodes, using 0·2N-HCl. The stimulating action of an external cathode (Pt) is connected with the transformation of microanodes of the electrode into microcathodes.

BOGOYAVLENSKY, V.

[illegible].—Kinetics of the Accumulation of Al^{+3} Ions in the Anodic Space of Carbonate Baths. A. F. Bogoyavlensky and G. N. Tolkin (*Zhur. Prikład. Khim.*, 1954, 27, (12), 1257–1262).—[In Russian]. Cf. B., *Abst.*, 1947, 20, 632, 813. Specimens of Duralumin DT-16 (Cu 3-74, Mg 0-9, Si 0-2, Fe 0-43%) sheet, 1 mm. thick, area 0-264 dm.^{2}, were anodized in Na_2CO_3 soln., the quantity of electricity used being measured with a Cu coulometer and the Al^{+3} content of the anode space determined after various intervals. Tests at 30° C. in 5% Na_2CO_3 soln., with bath voltages of 50–80 V. and c.d. of 0-1–0-4 amp./dm.^{2}, showed that in the initial 20–30 min. the speed of dissolution of the anode exceeded the rate of formation of the "equivalent film" (i.e. the difference between the amount of Al_2O_3 formed—calculated from the quantity of electricity passed—and that which dissolved in the bath), but after this period the latter became the greater. Since the previous work indicated that the best films were produced on anodizing for 20–30 min., the presence of Al^{+3} ions in the anolyte must be necessary. As the c.d. was increased, the initial discrepancy between the two rates increased, as did the protective value of the film. The current efficiency of the film-forming process fell from 62-8 to 44-9% as the c.d. increased from 0-1 to 0-4 amp./dm.^{2}. Tests at 75°–60° C. showed that at increased temp. the bath rapidly became saturated with Al^{+3} ions; the protective value of the film was greatest for baths at 30° C. Other experiments at 0-3 amp./dm.^{2} and 30° C. with baths contg. 2–15% Na_2CO_3 showed that increasing the concentration increased both the rate of accumulation of Al^{+3} ions in the bath and the limit of saturation; coatings prepared in 5% soln. had the greatest protective value. The optimum conditions chosen previously have been confirmed; under these conditions the rates of dissolution and film formation are equal.—G. V. E. T.

(1)

Bogoyavlenskiy, A. F.

USSR/Optics - Optical Technique, K-4

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35702

Author: Bogoyavlenskiy, A. F.

Institution: None

Title: Optical Measurement of the Thickness of Anode-Formed Oxide Films

Original Periodical: Zavod. laboratoriya, 1956, No 1, 64-66

Abstract: To determine the thickness of an anodic Al_2O_3 film, the V. P. Linnik double microscope is used (MMS-11). An "irregularity step" is produced on the oxidized surface of the metal, i.e., a boundary between the surface of the oxide film and the surface of the underlying metal.

Card 1/1

BOGOYAVLENSKIY, A. F.

USSR /Chemical Technology. Chemical Products and Their Application I-11

Electrochemical manufacturing. Electrodeposition. Chemical sources of electrical current

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31417

Author : Bogoyavlenskiy A.F., Siletskaya N.V.

Title : Effect of Anodic Passivation Method and Electrolyte Concentration on Porosity of Al_2O_3 Film

Orig Pub: Zh. Prikl. Khimii, 1956, 29, No 8, 1295-1297

Abstract: Studies of the porosity (P) of anodic Al_2O_3 films formed on sheets of Al (D-16-T alloy) by the sulfuric acid (SA), chromic acid (CA) and the carbonate (C) methods. P of the films was determined by filling with mineral oil (Tomashov, Byalobzheskiy, Tr. in-ta fiz. khimii, AN SSSR, 1951, 3, 17). P of

Card 1/2

USSR /Chemical Technology. Chemical Products and Their Application I-11

Electrochemical manufacturing. Electrodeposition. Chemical sources of electrical current

Abs Jour: Referat Zhur - Khimiya, No 9, 1957, 31417

the films was determined by filling with mineral oil (Tomashov, Bualobzheskiy, Tr. in-ta fiz. khimii, AN SSSR, 1951, 3, 17). P of films formed by the SA and C method, increases with increasing concentration of the electrolyte, while that of films formed by the CA method is little dependent on the concentration. The following "porosity series" of film was ascertained under standard operating conditions of the cells: P_{SO_4}- P_{CrO_4}- P_{CO_3}-. See also RZhKhim, 1954, 28573.

Card 2/2

BOGOYAVLENSKIY, A.F.; ISHKIN, A.Z.

Investigating the anodic passivation of aluminum alloys. Trudy KAI 31 '56. (MLRA 10:5)

(Aluminum alloys--Electrometallurgy)

BOGOYAVLENSKIY, A.F.

AUTHOR: BOGOYAVLENSKIY, A.F., SHAMES, S.I. 32-6-29/54

TITLE: Improved Construction of an Apparatus for Measuring the Elasticity of Anode Coatings. (Usovershenstvovaniye pribora dlya izmereniya elastichnosti anodnykh plenok, Russian)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol 23, Nr 6, pp 731-733 (U.S.S.R.)

ABSTRACT: As the protective properties of anode oxide coatings on aluminum and its alloys depend in a high degree on the elasticity of the coating, M.N.TYUKIN developed a method for the determination of this elasticity. It is judged according to the argle of the curvature of the sample which occurs at the moment of the first cracks that form on the coating. An apparatus - and elastometer - was constructed which was completed according to the last suggestions made by G.AKIMOV, N. TOMASHOV and M. TYUKINA, mainly by the fact that the aforementioned cracks on the anode coatings were recorded by means of a kinematic photocamera. Observations made showed that the elasticity found here represents a value which is inversely proportional to the angle of curvature on the occasion of the formation of cracks, and which is due mainly to the increase of the concentration of the electrolyte. An increase of the time of anodization reduces the elasticity of the coating. (With 4 Drawings and 3 References)

Card 1/2

32-6-29/54

Improved Construction of an Apparatus for Measuring the Elasticity of Anode Coatings.

ASSOCIATION: Institute for Aviation, Kazan
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

Card 2/2

BOGOYAVLENSKIY, A.F

BOGOYAVLENSKIY, A.F.; VEDERNIKOV, A.P.

[redacted]

Using radioactive isotopes for studying the kinetics of electrolyte (SO_4^{2-}) ion agglomeration in the anodic film Al_2O_3. Zhur.prikl.khim. 30 no.12:1868-1871 D '57. (MIRA 11:1)

(Sulfur--Isotopes) (Electrolysis) (Alumina)

137-58-4-7894

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 219 (USSR)

AUTHORS: Shames, S. I., Bogoyavlenskiy, A. F.

TITLE: The Tampon (Bathless) Method of Anodic Passivation of Aluminum Alloys. Development of a Tampon Passivation Procedure. Communications I and II [K voprosu o tamponovom (bezvannom) metode anodnogo passivirovaniya alyuminiyevykh splavov. Razrabotka rezhima tamponovogo passivirovaniya. Soobshcheniye I i II]

PERIODICAL: Tr. Kazansk. aviats. in-ta, 1957, Vol 37, pp 56-71

ABSTRACT: A process for local anodizing (A) of the D16T Al alloy and the skin of the MIG-15 aircraft in H_2SO_4 solution is investigated. A tampon of heavy woolen felt cloth impregnated with the electrolyte is placed on the portion of the surface to be anodized. The cathode is a Pb electrode within the tampon. The time required for a drop of solution containing 25 cc 1.19 sp. gr. HCl, 3 g $K_2Cr_2O_7$, and 75 cc H_2O applied to the anodic coating (C) to turn green is the criterion of the corrosion resistance of the C. The effect of the duration of A, D_A, and the strength of the electrolyte on the protective properties of the C were studied. By

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The Tampon (Bathless) Method (cont.)

plotting lines of equal elapsed time it was determined that the optimum A procedure is one employing 10 to 15% H_2SO_4, 1.0-1.5 amps/dm^2 D_A, and at $\leq 30^o$. The anodic C thus formed is equal in protective properties to the C produced by the usual method, under conditions of complete immersion of the parts to be anodized in a bath. It was found that in local A, the curve of the increase in the anodic C with time passes through a maximum. The increase in the C on local A goes faster than in a case of A in a bath, and, in the author's opinion, this is explained by the strong oxidizing action of the tampon and the diminished throwing power of the tampon bath.
Bibliography: 17 references.

Ye. Z.

1. Aluminum alloys--Corrosion prevention

Card 2/2

BOGDYAVLENSKIY, M.F.

Distr: 4E2d/4E4j/4E3d

Carbonate anodization of aluminum alloys. VII. Effect of temperature and concentration of the solution on the content of the electrolyte anion in the anode oxide film determined with tagged atoms. [illegible] and A. P. Vedernikov. Zhur. [illegible] Sci. U.S.S.R. 34, 1900(1).—Al plates were passivated 10 min. in H_2SO_4 soln. contg. $S^{35}O_4^{--}$ with an anodic c.d. of 2 amp./sq. dm. At 37° the SO_4^{--} content in the anodic film increased from 10.2 to 12.8% and the film thickness decreased from 4.1 to 3.17 μ as the H_2SO_4 concn. in the electrolyte increased from 2 to 20%. In an electrolyte contg. 10% H_2SO_4, the SO_4^{--} content in the film decreased from 15.1 to 9.5% and the film thickness decreased from 4.07 to 0.67 μ as the temp. increased from 10 to 50°. The colloidal structure of the anodic film suggested a micelle structure of $[(nAl_2O_3.mH_2O).xSO_4]^{2x-}.2xH^+]$. The negligible effect of the H_2SO_4 concn. on the film compn. was ascribed to the dissolving effect of the acid increasing the porosity of the film. Increasing the temp. decreased the proportion of SO_4^{--} entering the micelle. These results support Mason's conclusions (C.A. 33, 6211⁸). I. Beilenson

APANAS'YEV, P.S.; BOGOYAVLENSKIY, A.F., prof., doktor khim.nauk, red.; LODVIKOVA, A.S., red.; GALKINA, V.N., tekhn.red.

[Corrosion of metals and ways to control it] Korroziia metallov i mery bor'by s nei. Kazan', Tatarskoe knizhnoe izd-vo, 1959. 81 p. (MIRA 14:2)
(Corrosion and anticorrosives)

S/081/61/000/014/004/030
B106/B110

AUTHOR: Bogoyavlenskiy, A. F.

TITLE: Use of the method of radioisotopes for studying the anodic passivation of aluminum and the theory of the formation mechanism of an oxide film

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 14, 1961, 86, abstract 14B596. (Izv. Kazansk. fil. AN SSSR. Ser. khim. n., no. 5, 1959, 155 - 162)

TEXT: The author determined the content of SO_4^{2-} ions in the anodic oxide film on aluminum obtained by molding in 0.7 N H_2SO_4, by the method of tagged atoms using the radioisotope S^{35}. The maximum amount of SO_4^{2-} is absorbed by thin oxide films. The SO_4^{2-} content in the film slightly rises with increasing concentration of H_2SO_4 in the solution, whereas it rapidly drops at a temperature increase. The concentration of SO_4^{2-} ions in the

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Use of the method of...

film is low near the metal, and increases in the outer layers of the film. The author is of opinion that the electrolyte ions enter the structure of the oxide-film composition. The growth of the film is accompanied by an emergence of Al^{3+} ions into the solution where they form, with the electrolyte ions, nuclei of oxide micelles which coagulate on the aluminum surface. [Abstracter's note: Complete translation.]

Card 2/2

83068

S/153/60/003/004/003/006
B004/B058

26.1640

AUTHOR: Bogoyavlenskiy, A. F.

TITLE: Applicators of Radioactivity on the Basis of an Anodic Al_2O_3 Oxide Film

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 4, pp. 611 - 615

TEXT: This paper was read at the 1st Intercollegiate Conference on Radiochemistry, Moscow, April 20-25, 1959. In the introduction, the author mentions the methods known for the anodic passivation of aluminum alloys by means of an oxide layer (Table 1). On the basis of publication data, among them by V. A. Kistyakovskiy (Ref. 3), S. S. Gutin (Ref. 4), N. D. Tomashov (Ref. 5), he explains the colloidal structure of this oxide film, for which he mentions formula: $\left[(nAl_2O_3 \cdot mH_2O)xA\right]^{-x} \cdot xK^+$ (A = anion and K = cation of the electrolytic bath used, n, m, x = coefficients, dependent on methods applied and experimental conditions). The author infers therefrom that radioactive isotopes can be introduced into the

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oxide film, i.e. 1) by the electrolytic bath, the anion of which contains the respective isotope, 2) by ion exchange, the metal with the not yet activated film being dipped into a solution containing the isotope. The experimental data of the introduction of the following isotopes into the oxide film are listed in Table 2: S^{35}, P^{32}, C^{14}, Cr^{51}, W^{185}, Co^{60}. Fig. 1 shows the increase of the S^{35} content in the oxide film, Fig. 2 the influence of the concentration of the SO_4^{2-} ions in the bath on the process. The content of SO_4^{2-} ions in the film can be increased up to 13%. Fig. 3 shows the W^{185} content of the film as a function of temperature. The specific activity of the applicator can be expressed by equation $I = I_o(\log c - d).10^{-5}$ (I = activity of the applicator, I_o = activity of the solution, c,d = coefficients). Fig. 4 shows the change of I in a film, which was formed in an inactive H_2SO_4 bath and then activated with P^{32} in phosphate solution. [Abstracter's note: The text for Fig. 4 reads however:

83068

Applicators of Radioactivity on the Basis of an Anodic Al_2O_3 Oxide Film

S/153/60/003/004/003/006
B004/B058

Influence of the temperature on the increase of the W^{185} content in the anodic film]. Investigations by the Tsentral'nyy nauchno-issledovatel'skiy rentgenoradiologicheskiy institut Ministerstva zdravookhraneniya SSSR (g.Leningrad) (Central Scientific Research Institute of Roentgenology and Radiology of the Ministry of Sanitation of the USSR Leningrad) showed a uniform distribution of the radioactive layer (Fig. 5). The radioactivity of such applicators is not lost by rinsing, and is stable against mechanical influences owing to the great hardness of the oxide film. Self-absorption is also negligible owing to the minute thickness of the film. Such applicators could be used in automation, as ionizers, in laboratories, in medicine, agriculture etc. There are 5 figures, 2 tables, and 13 references: 7 Soviet, 2 US, 1 British, 1 Canadian, and 1 German.

ASSOCIATION: Kazanskiy aviatsionnyy institut, Kafedra obshchey khimii (Kazan' Aviation Institute, Chair of General Chemistry)

Card 3/3

S/153/60/003/004/004/006
B004/B058

AUTHORS: Bogovavlenskiy, A. F., Belov, V. T., Kozyrev, Ye. M.

TITLE: Investigating the Sorption of Phosphate Ion on the Anodic Oxide Film of Aluminum by the Method of Traced Atoms

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 4, pp. 616 - 619

TEXT: This paper was read at the 1st Intercollegiate Conference on Radiochemistry, Moscow, April 20-25, 1959. The sorption of phosphate ions on the anodic oxide film of aluminum has not yet been studied sufficiently (Ref. 13). For this reason, the authors carried out experiments with samples of aluminum sheet type АД-1 (AD-1), which were anodically treated in a sulfuric acid bath under standard conditions (D_a = 1a/dm^2, t = 20°C, τ = 20 min, $C_{H_2SO_4}$ = 20%). Before the treatment with phosphate solution, the oxide film had a weight of 1.38 mg/cm^2, a thickness of 5.8μ, a porosity of approximately 30%, and a corrosion resistance of 16 min

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Investigating the Sorption of Phosphate Ion on the Anodic Oxide Film of Aluminum by the Method of Traced Atoms

S/153/60/003/004/004/006
B004/B058

according to the drop reaction of the VIAM. The film was treated with aqueous solutions of Na_2HPO_4, containing P^{32}. Sorption and desorption of the phosphate ion was determined by means of AC-2 (AS-2) counter in a S-2 (B-2) apparatus. The number of impulses per unit area was calculated according to an equation by N. A. Balashova and N. S. Merkulova (Ref. 16). Fig. 1 shows the sorption of the phosphate ion at 10°C during 30 min as a function of the phosphate concentration (0.007 - 0.280 mole/l). In the entire concentration range investigated, the sorption increased with increasing concentration of Na_2HPO_4. A condition of equilibrium was not obtained even after 200 h. Fig. 2 shows that sorption begins to rise noticeably at temperatures of from 50 to 60°C. It can be seen from Fig. 3 that the phosphate content of the film increased quickly right at the start, although a noticeable increase in weight set in only after about 10 hours. This is explained by the fact that an ion exchange takes place at the start between the sulfate ions contained in the film and the phosphate ions contained in the solution, and that a chemical interaction

Card 2/3

of the phosphate ion with the micelles of the film sets in only later. Extraction by means of water, acetone, dioxane, covering of the film with mineral oil and subsequent extraction with acetone did not lead to a desorption of the phosphate ion. The desorptive effect of various salts dissolved in water is tabulated. While Cl^- - and Br^- ions do not desorb, the film is destroyed by sodium fluoride and sodium citrate, and an exchange of the HPO_4^{2-} ions contained in the film sets in with SO_4^{2-} - and CrO_4^{2-} ions. The authors mention a paper by V. A. Kistyakovskiy (Ref. 7). There are 3 figures, 1 table, and 16 references: 11 Soviet, 1 US, 3 British, and 1 Indian.

ASSOCIATION: Kazanskiy aviatsionnyy institut, Kafedra obshchey khimii (Kazan' Aviation Institute, Chair of General Chemistry)

S/153/60/003/006/005/009
B103/B206

AUTHORS: Bogoyavlenskiy, A. F., Aleksandrov, Ya. I.

TITLE: Problem of the ultramicroscopic study of the layer of the electrolyte close to the anode in the electrochemical oxidation of aluminum

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, v. 3, no. 6, 1960, 1062-1066

TEXT: The authors report on the study of the layer of the electrolyte close to the anode by means of ultramicroscope in the electrochemical formation of the protective oxide film on the aluminum anode. Such studies are complicated by the abundant gas separation at the anode. For this reason the authors elaborated the carbonate method of the anodic passivation of aluminum (elaborated by A. F. Bogoyavlenskiy, Ref. 17) and used pyrogallol as oxygen absorbent. The working solutions were prepared from reagents of the "Goslaborsnabzheniye" (Gosudarstvennyy trest po proizvodstvu i sbytu laboratornogo snabzheniya, State Trust for the Manufacture and Marketing.

Problem of the ultramicroscopic...

of Laboratory Equipment). Clean aluminum sheets of the type АД1М(AD1M) were oxidized in a 5% Na_2CO_3 solution according to the methods described (Ref. 17). The composition of the gas separated at the anode was determined by means of the instrument by R. K. Gol'ts (Ref. 18) and amounted to 96.5% O_2 as well as 3.5% H_2. 1% pyrogallol concentration stopped the gas separation entirely. The formation of the oxide film was not impaired thereby in any way. The amount of separated gas was determined as being 6.88 ml per 1 dm^2 anode surface. For ultramicroscopic studies the authors used an electrolyzer with a capacity of 7 ml made from plexiglass with a glass wall. Iron served as the cathode. The authors established in the currentless state a layer of ultramicrons with clear contours uniformly distributed on both sides of the electrodes. The colloidal micelles of the lead hydroxide are in a state of energetic Brownian motion. When current is applied, the ultramicron layer is enriched through colloidal micelles, torn, and forms a peculiar torch, which is directed with its point towards the cathode (G. S. Vozdvizhenskiy, Ref. 14). No colloidal particles could be seen in the vicinity of the anode at a 1% pyrogallol

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content in the electrolyte. The authors explain the presence of the hydrogen in the anode gas by the process: $2Al + 2OH^- + 2H_2O \longrightarrow 2AlO_2^- + 3H_2\uparrow$, this process playing a very modest role in the total mechanism of anodic oxidation of the aluminum. The oxygen separation (96 to 97%) is explained on the basis of the scheme by A. I. Krasil'shchikov (Ref. 19): $OH^- - e \longrightarrow OH$, $OH + OH^- \longrightarrow H_2O + O^-$, $O^- - e \longrightarrow O$, $O + O \longrightarrow O_2$. On the basis of this scheme the authors assume that the O^- ions penetrate the anode film at the same places where it originates and there cause its further formation (in agreement with Ref. 6). The excess O^- ions are discharged at the anode and escape. The pores in the film are apparently formed according to the mechanism of the actual dissolution of the film substance in the electrolyte due to chemical interaction. There are 4 figures and 19 references: 16 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATON: Kazanskiy aviatsionnyy institut; Kafedra obshchey khimii (Kazan' Aviation Institute; Department of General Chemistry)

SUBMITTED: January 5, 1959

Card 3/3

BOGOYAVLENSKIY, A.F.; BOGOYAVLENSKIY, I.F.; BOGOYAVLENSKIY, V.F.; RACHEVSKAYA, L.S.

Problem of application in radiotherapy. Med.rad. 5 no.3:47-51 '60. (MIRA 13:12)

(RADIOTHERAPY)

S/063/60/005/005/021/021
A051/A029

AUTHOR: Bogoyavlenskiy, A.F.

TITLE: Apropos of Obtaining Radio-Active Irradiation Sources Using Oxide Films on Aluminum and Its Alloys

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D.I. Mendeleyeva, 1960, No. 5, Vol. 5, p. 600

TEXT: The author stresses the need for evaluating the methods of production of radioactivity applicators, as well as their physico-chemical and technical properties. According to the author, an inaccurate evaluation of the methods and results accomplished in this field in the USSR were given in a paper presented at the Conference on the Application of Radioactive and Stable Isotopes in 1957 by M.S. Petrova on "The Production of Sources of α-, β- and γ-Emissions Using Oxide Films on Aluminum and Its Alloys", published in the "Works of the Conference on the Application of Radio-Active and Stable Isotopes and Radiations in the National Economy", Publishing House of the AS USSR, Moscow, 1958, p. 55. The author, in a previous article (Ref. 1),

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S/063/60/005/005/021/021
A051/A029

Apropos of Obtaining Radio-Active Irradiation Sources Using Oxide Films on Aluminum and Its Alloys

investigated the composition of anode oxide films on aluminum and its alloys, using radioactive isotopes. The films were obtained in electrolytes with various pH (more and less than 7). The established complex composition of the anode films was confirmed by Soviet (Ref.2) and foreign scientists (Ref.3). The following conclusion was drawn: it is possible to introduce anions with various characteristics into the anode film during its anode formation (Ref.4). To accomplish this it is sufficient to introduce into the electrolyte of the bath where the film is being formed a compound, the anion of which is stable in the chosen medium. It is taken for granted that if some radioactive element is part of the anion composition, then the latter will incorporate itself in the anode film and render it radioactive. By changing the conditions of the process of the film formation the content of the isotope in the film can be varied to a certain extent and thus its activity. This method for the production of applicators of radioactivity is said to be simple, reliable and not requiring deviations from the usual technology of film formation. In disputing the criticism offered by Petrova, the author

S/063/60/005/005/021/021
A051/A029

Apropos of Obtaining Radio-Active Irradiation Sources Using Oxide Films on Aluminum and Its Alloys

of this work emphasizes the fact that the technology of the film formation is retained and does not deviate from the usual procedure, with the one exception that an electrolyte is used which contains a radioactive isotope in its composition. The isotope introduced into the film should be contained in the anion, stable in the electrolyte where the film is being formed. Either a "natural anion" of the bath electrolyte or an anion introduced into the bath artificially can serve as the specified anion. In the latter case it should be retained at the pH of the bath. The author further states that the stability of the anion in the electrolyte of the bath increases the "nomenclature". The introduction of the Co^{60} isotope into the anode film can be carried out. if the initial anion contains the isotope in question. The same applies to Zn^{65}, contrary to attempts made by Petrova. The apparatus used for the production of the active and non-active anode film is the same, which implies that the equipment is kept as simple as possible. The author concludes that a true evaluation of the method discussed will help to attract those interested in this procedure. There are 5 references: 4 Soviet, 1 English.

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BOGOYAVENSKIY, A.F.; BELOV, V.T.

Computation variant for the surface activity of flat metal applicators and its experimental principle. Med. rad. 5 no.11:67-70 N '60. (MIRA 13:12)

(RADIATION--MEASUREMENT)

S/079/60/030/05/60/074
B005/B125

5.3200

AUTHORS: Bogoyavlenskiy, A. F., Senina, L. N.

TITLE: The Interaction Between 2,4-Dinitro Phenol and Thiourea

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 5, pp. 1684-1685

TEXT: The authors of the present report investigated the system 2,4-dinitro phenol - thiourea with the aid of thermal analysis. The industrial 2,4-dinitro phenol used crystallized after double recrystallization from acetone in the form of rhombic prisms with a melting point of 113°. The thiourea used (analytically pure) had a melting point of 172° after double recrystallization from alcohol. The melting points in the system studied were determined by a visual capillary method. Fig. 1 shows the melting diagram of the system studied. Two chemical compounds form in the system: $C_6H_3(NO_2)_2OH.CS(NH_2)_2$ (I) (melting point 165°) and 4 $C_6H_3(NO_2)_2OH.CS(NH_2)_2$ (II) (melting point 118°). Three corresponding eutectic mixtures occur with the melting points 90°, 110°, and 155°. Both chemical compounds mentioned belong to the berthollide type. They differ in their crystal structures

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The Interaction Between 2,4-Dinitro Phenol and Thiourea

S/079/60/030/05/60/074
B005/B125

and colorations. The compound (II) crystallizes in the form of long needles, which are orange in color; whereas compound (I) solidifies in the form of extraordinarily small crystals yellow in color. Figs. 2-5 show microlayers of the compounds (I) and (II) and of both initial products, 2,4-dinitro phenol and thiourea. In the carrying out of the thermal analysis no evolution of gas occurred in the system under investigation, as would be characteristic of the formation of dinitro aniline in the fusion of thiourea and 2,4-dinitro phenol. This behavior is in contrast to the reaction of 2,4-dinitro phenol with urea, in which dinitro aniline forms. There are 5 figures and 6 references, 4 of which are Soviet.

ASSOCIATION: Kazanskiy aviatsionnyy institut (Kazan' Institute of Aviation)

SUBMITTED: March 12, 1959

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18.7400, 21.7200

77638
SOV/80-33-2-13/52

AUTHORS: Bogoyavlenskiy, A. F., Dobrotvorskiy, G. N.

TITLE: Experiments With the Introduction of Radioactive Isotope W^{185} Into the Anodic Al_2O_3 Film During Its Formation

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 2, pp 340-344 (USSR)

ABSTRACT: This is Communication VIII of a series of studies on the anodic oxidation of aluminum. Discs made of D16AT duraluminum were oxidized in 5% Na_2CO_3 solution containing a predetermined amount of $Na_2W^{185}O_4$, and the $W^{185}O_4^-$ anion was introduced in this manner into the Al_2O_3 film. To prevent erroneous results in the determination of the specific surface radioactivity,

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only one side of the discs was exposed to oxidation, the other being covered with AK-20 lacquer which did not absorb the radioactive isotope. The anodizing was done in electrolytes with specific radioactivity I_1 from 1 μC/ml to 25.80 μC/ml; the voltage was maintained at 156 v, the current density varied from 0.25 to 1 amp/dm^2. An iron electrode was used. The radioactivity was measured with a B-2 and end-window counter. Analysis of the data obtained gave the following empirical equations expressing the radioactivity as function of the parameters of the anodizing process. For electrolytes with specific radioactivity of 1 μC/ml and 10 μC/ml, the specific activity I of the oxide film is expressed by Eqs. (1) and (2), respectively:

$$I = 0.8 \cdot 10^{-4} \lg \tau - 0.29 \cdot 10^{-4}; \quad (1)$$

$$I = 8.1 \cdot 10^{-4} \lg \tau - 3.2 \cdot 10^{-4}, \quad (2)$$

where τ is oxidation time (in min). The activity, I, can be expressed as a function of I_1 by Eq. (3):

$$I = I_1 (8.0 \lg \tau - 3.0) \cdot 10^{-5}. \quad (3)$$

The relationship between I and the current density (in amp/dm^2) can be expressed by Eqs. (4) and (5):

$$\lg I = -1.85 - \frac{0.67}{D_a}, \quad (4)$$

$$I = 0.01413 \cdot e^{-1.543/D_a}. \quad (5)$$

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The above equations may be useful for the preparation of radioactive applicators based on the isotope W^{185} and the anodic film Al_2O_3. There are 4 figures; and 6 references, 1 U.S., 5 Soviet. The U.S. reference is: R. Mason, J. Electroch. Soc., 102, 12, 671 (1955).

SUBMITTED: December 27, 1958

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5.1310

77643
SOV/80-33-2-18/52

AUTHORS: Bogoyavlenskiy, A. F., Ivanov, B. Ye., Khudyakov, V. L.

TITLE: Chromium Plating of Aluminum by Superposing Alternating and Direct Currents

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 2, pp 368-372 (USSR)

ABSTRACT: The authors studied: rectifying effect of the cell with standard chromium electrolyte and aluminum cathode; polarization of aluminum cathode in the chromium electrolyte upon superposing of alternating current; effect of alternating current upon the yield; its microrigidity and strength of its adherence to the base. Figure 2 shows that the rectifying effect of the chromium electrolyte (250 g/l CrO_3 and 2.5 g/l H_2SO_4 measured at 50° for various current densities) in the cell with an aluminum anode and lead cathode is inversely

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proportional to the current density.

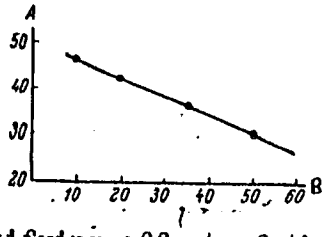

Fig. 2. Rectifying effect of the cell with the chromium electrolyte. (A) degree of current rectification (in %); (B) current density (in amp/dm^2).

Black, porous film, forming on the surface of the aluminum electrode at low current densities changes into light, well adhering film with increasing current density. After the current density reaches ~ 70 amp/dm^2 the aluminum electrode becomes a cathode and the rectifying effect disappears. The assembly used to obtain data for construction of

polarization curves in electrolysis with superposed currents is shown in Fig. 1.

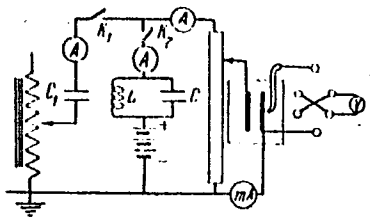

Fig. 1. Diagram for polarization and current density measurements with superposed alternating and direct currents.

Direct current was supplied by a storage battery through a rheostat; the 50 cycle alternating current passed through a potentiometer which also served as a mixer. Capacitor C_1 = 160 μ f was

connected into the circuit of alternating current. Oscillation circuit LC was tuned for 50 cycles. Use of this assembly allowed one to vary the ratio of alternating direct current densities and to keep them constant during the taking of polarization curves. Platinum anode and aluminum cathode of composition Al, 99.894%; Si, 0.065%; Fe, 0.041%, were used. Figure 3 shows the polarization curves obtained for various ratios of alternating-direct current densities. The shape of the polarization curves led to the following explanation of the process: at an electrode potential below 0.8 v, the action of alternating current prevails, causing formation of an oxide coating on the surface of aluminum, i.e., the aluminum electrode becomes an anode, and the current density remains constant. Above 0.8 v the electrode becomes a cathode and chromium plating begins. The yield of chromium based on current depends upon the $\frac{D_{=}}{D_{\sim}}$ ratio and

Chromium Plating of Aluminum by Superposing Alternating and Direct Currents

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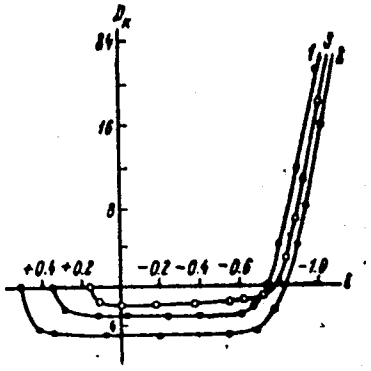
Fig. 3. Polarization curves obtained in superposition of alternating and direct currents. The samples were pickled in 5% solution of HCl. D_K is cathodic current density (in amp/dm^2), $\mathcal{E}$ is potential (in v). Ratio of densities of direct alternating currents $\frac{D_{\text{—}}}{D_{\sim}}$ equals 1 - 3; 2 - 2; 3 - 1.



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Chromium Plating of Aluminum by Superposing Alternating and Direct Currents

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the absolute densities of the alternating and direct currents. Chromium plating starts only at a $\frac{D -}{D \sim}$ ratio of 2, with the yields equal to 11% at 10 amp/dm^2 and 10.7% at 20 amp/dm^2 (for $\frac{D -}{D \sim}$ = 3, the yields were 10.8% at 10 amp/dm^2, 12.1% at 35 amp/dm^2 and 10.2% at 70 amp/dm^2). Measurements of adherence of chromium deposits obtained in electrolysis with superposed current on the aluminum cathode pickled in 5% HCl (after preliminary degreasing it in 10% NaOH) gave poor results. Samples pickled in a mixture of 2% H_3PO_4 and HF solutions had higher (and reproducible) adherence strength up to 50 amp/dm^2. There are 3 figures; and 5 references, 2 Soviet, 1 U.K., 2 U.S. The U.S. and U.K. references are: Bunce, Bernard E., Electroplat. and Metal Spraying, 6, 317 (1953); Bunce, Bernard E., Metal Finish., 52, 70 (1954);

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Chromium Plating of Aluminum by Superposing Alternating and Direct Currents

77643
SOV/80-33-2-18/52

Passal, Frank, U.S. Patent 2662054, 8, 12 (1953).

ASSOCIATION: Izhevsk Mechanical Institute (Izhevskiy mekhanicheskiy institut)

SUBMITTED: February 9, 1959

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25234

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S/080/61/034/008/018/018
D204/D305

AUTHORS: Bogoyavlenskiy, A.F. and Matyazh, N.K.

TITLE: Trial introduction of the isotope Au^{198} into anodic oxide film on aluminum

PERIODICAL: Zhurnal prikladnoy khimii, v. 34, no. 8, 1961, 1892-1893

TEXT: An attempt to introduce the isotope Au^{198}, taken as the anion $(AuCl_4)^-$, into oxide film that is formed on aluminum and its alloys by the anode process is described in this paper. The residue obtained from evaporating a solution of gold (marked by the isotope Au^{198}) in aqua regia is added to the sulphate electrolyte that is used in the method of anodic oxidation of aluminum developed by L. Kadaner (Ref. 3: Zashchitnyye plenki na metallakh (Protective Films on Metals), Khar'kov, 67, 1956). 5 x 5 cm plates of degreased aluminum are then placed in this solution with the Au^{198} marker and are coated with oxide at a current density of 2 A/dm^2, the electrolyte being cooled to 10 - 12° in the process of coating. Next the plates

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S/080/61/034/008/018/018
D204/D305

Trial introduction...

are washed and boiled in distilled water for 30 minutes. Their radioactivity is subsequently measured by a B-2 device in which the specimen is shielded by a lead plate having a thickness of 2 mm and an aperture of 2 mm in diameter at its center. The counts are then compared with those obtained under similar conditions except for the fact that the lead plate is unperforated. The results show that Au^{198} may be introduced into anodic oxide film on aluminum provided it is added to the electrolyte bath in the form of the anion $(AuCl_4)^-$; the amount of Au^{198} so introduced increases with increasing time of the process of film formation. As has already been suggested by A. Bogoyavlenskiy (Ref. 4: Izv. Kazanskogo Fil. Akad. Nauk SSSR, ser. khim. nauk, 5, 155, 1959), this technique of radioactivity application is very convenient in view of the negligible thickness of the film-carrier and the high mechanical simplicity of the apparatus. On the basis of these data the authors recommend the further use of this method of isotope introduction during anodic film formation, a conclusion also reached by V. Grablevskiy et at (Ref. 5: Izotopy, istochniki izlucheniya i radioaktivnyye materialy (Isotopes, Radia-

Trial introduction...

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D204/D305

tion Sources and Radioactive Materials). Atomizdat, Moscow, 198. 1959). There are 1 table and 5 Soviet-bloc references.

ASSOCIATION: Kazanskiy aviatsionnyy institut (Kazan Aviation Institute)

SUBMITTED: October 25, 1960

X

Card 3/3

BOGOYAVLENSKIY, A.F.; SHAMES, S.I.

Obtaining enamel anode oxide films on aluminum and its alloys.
Trudy KAI no.70:22-31 '62. (MIRA 18:4)

S/147/62/000/001/015/015
E073/E535

AUTHOR: Bogoyavlenskiy, A.F., Professor, Doctor of Chemical Sciences (Kazan')

TITLE: Anodic protection of metals. First inter-university conference

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, no.1, 1962, 125-128

TEXT: This conference was held on November 16-18, 1961 at the Aviatsionnyy institut (Aviation Institute), Kazan'. Personnel from twenty higher teaching establishments and thirty-seven industrial undertakings participated. The following papers were read:
Professor A. I. Krasil'shchikov "On the anodic generation of oxygen"; Professor A. F. Bogoyavlenskiy "On the mechanisms of the process of forming anodic films on aluminium"; Docent A.V.Shreyder "On the energy of activation and the mechanism of the process of anodic oxidation of aluminium alloys"; Professor G.S.Vozdvizhenskiy and Assistant I. M. Novosel'skiy "Radical-ionic mechanism of the anodic dissolution of aluminium under conditions of phase polarization;

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Assistant Ya. I. Aleksandrov and Professor A. F. Bogoyavlenskiy (Aviation Institute, Kazan') "Certain relations governing the process of anodic oxidation of aluminium and ultra-microscopy of the near-anodic space"; Professor G. S. Vozdvizhenskiy and Assistant I. M. Novosel'skiy(gKazan', Khimiko-tekhnol.in-t, Chemical-Technological Institute, Kazan') "On the influence of intercrystallite failure of metals under conditions of dissolution"; Assistant A. P. Vedernikov and Professor A. F. Bogoyavlenskiy "Features of penetration of anions into the anodic oxide film on aluminium"; Candidate of Chemical Sciences Ya. I. Tur'yan and Aspirant A. I. Tsinman(gLisichansk, filial GIAP SSSR, Lisichansk Branch GIAP USSR) "Influence of the concentration and of the nature of the alkali on the oxygen over-voltage on the anode"; Professor A. F. Bogoyavlenskiy and Assistant G. N. Dobrotvorskiy "Study of the process of penetration of ions of the electrolyte into the anodic Al_2O_3 film during its formation by the carbonate method; Candidate of Chemical Sciences R. M. Al'tovskiy and Professor N.D.Tomashov (IFKh AN SSSR, Moscow) "Anodic protection of titanium in sulphuric and hydrochloric acids; Professor N. D. Tomashov and

and T. P. Chernova "Anodic protection - a new method of electrochemical protection of metals against corrosion"; Professor A.Ya. Shatalov, Candidate of Chemical Sciences I. K. Marshakov and Aspirant A. S. Kaluzhina (g.Voronezh gos.un-t, Voronezh State University) "Influence of the temperature on the anodic behaviour of some metals under conditions of operation of corrosion microcouples"; Professor N. D. Tomashov and Candidate of Chemical Sciences F. P. Zalivalov "On basic relations governing the process of solid anodizing of aluminium and its alloys"; M. P. Gracheva, A. M. Ginberg and Candidate of Chemical Sciences F. P. Zalivalov (Moscow) "Structure of non-transparent films on aluminium"; Professor A. F. Bogoyavlenskiy, Senior Engineer L. S. Rachevskaya and Engineer N. K. Matyazh "Influence of the current reversal on the state and properties of an anodic oxide film on aluminium according to data obtained by the method of labelled atoms"; Professor A. F. Bogoyavlenskiy and Assistant N. D. Dorofeyeva "On improving the protective properties of an anodic film on aluminium"; Docent S. I. Shames (Aviation Institute, Kazan') "On obtaining enamel anodic oxide films on aluminium and

its alloys"; Docent Ye. M. Kozyrev, Professor A.F.Bogoyavlenskiy and Senior Engineer V. T. Belov "Certain features of the sorption process on the anodic aluminium films and relations governing ion exchange in the anodic oxide film on aluminium"; Professor A.F. Bogoyavlenskiy "Anodic oxide films on aluminium as radioactivity applicators"; Candidate of Chemical Sciences I. K. Marshakov and Aspirant V. V. Malygin "Anodic behaviour of brasses"; Docent K. M. Filimonovich(g.Kiev, politekhnich.in-t, Kiev Polytechnical Institute) "Anodic method of oxidation of copper and its alloys"; Assistant A. L. L'vov and Docent A. V. Fortunatov(g.Saratov, gos. un-t, Saratov State University) "On passivating copper in concentrated alkali solutions"; Docent F. F. Fayzullin, Assistant N. N. Muzurova and D. A. Baytalova(g.Kazan', gos.un-t, Kazan' State University) "Investigation of the anodic oxidation of copper in solutions of potassium hydrate in presence of some amines"; Assistant A. L. L'vov and Docent A. F. Fortunatov "On the oxidation of copper by the persulphate method" and "Anodic behaviour of cadmium in concentrated alkali solutions"; Professor G. S. Vozdvizhenskiy and Aspirant E. D. Kochman "Volt-ampere curve investigations of the electrochemical behaviour of

zinc in some solutions"; Docent A. V. Fortunatov and Assistant L. K. Il'ina "Cold phosphating of cadmium and zinc"; Docent I. P. Dezider'yeva and L. F. Bychugova (Kazan' State University); "Anodic oxidation of zinc-cadmium alloys in solutions of potassium hydrate"; Docent K. M. Filimonovich "Anodic method of oxiding iron"; Docent F. F. Fayzullin and Assistant G.N.Mansurov "On anodic oxidation of iron in alkali solutions"; Docent I.P. Dezider'yeva, R. M. Sageyeva and M. M. Filippova "Anodic oxidation of iron-nickel and cobalt-nickel alloys in potassium hydrate solutions"; Senior Scientific Worker T. V. Matveyeva and Professor N. D. Tomashov "Anodic oxidation of titanium and of some of its alloys"; Professor A. F. Bogoyavlenskiy and Aspirant S.A. Borodina "Certain features of anodizing titanium and its alloys in sulphuric acid solutions"; Professor A. Ya. Shatalov, Assistant T. P. Bondareva, A. V. Tsygankova and A. V. Khitrov "Anodic behaviour of vanadium, niobium and zirconium"; Professor A. F. Bogoyavlenskiy, Aspirant I. P. Oranskaya "Certain results of comparative evaluation of the methods of passivating magnesium alloys"; Professor G. S. Vozdvizhenskiy, Junior Scientific Worker

G. A. Gorbachuk, Senior Scientific Worker G. P. Dezider'yev (g.Kazan', filial AN SSSR, Kazan' Branch,AS USSR) "On the problem of anodic passivation under conditions of electrolytic polishing"; Senior Scientific Worker V. A. Dmitriyev (Kazan'Branch, AS USSR) "Chemical polishing of aluminium and of the alloy ВД-17 (VD-17)"; Senior Scientific Worker V. A. Dmitriyev, Junior Scientific Worker V. Ye. Rzhevskaya and Senior Scientific Worker V.A. Khristoforov "Structure of a chemically polished surface"; Senior Lecturer V. L. Khudyakov (g.Izhevsk, mekhanich.in-t, Izhevsk Mechanical Institute) "Experience in the application of anodic films as a sub-layer in chromating aluminium and its alloys"; Assistant N. V. Avdeyev and Engineer N. A. Sergeyev (g.Tashkent, in-t inzh, zh.d.transporta, Institute of Railway Transportation Engineers, Tashkent) "Protection of components of the rolling stock against corrosion by spray-on metallizing"; Docent V. P. Pavelkina (Aviation Institute, Kazan') "Chemical analysis of oxide films of aluminium formed in a sulphuric acid electrolyte".

In the resolutions the delegates emphasized the importance of

speeding up investigations on: Radioactive applicators on the basis of anodic films on aluminium (Aviation Institute, Kazan'); chromium plating on aluminium (Izhevsk Mechanical Institute); phosphating of cadmium (Saratov University); Enamelling ("emataliring") of aluminium (Kazan' Aviation Institute); chemical polishing of alloys (Kazan' Branch, AS USSR); utilization of anodic protection against corrosion of plant made of stainless steels, titanium and other metals.

BOGOYAVLENSKIY, A.F., prof., doktor khim. nauk

Anodic protection of metals (proceedings of the first conference of institutions of higher learning in Kagan). Izv.vys.ucheb.zav.; av.tekh. 5 no.1:125-128 '62. (MIRA 16:7)
(Metals—Corrosion) (Oxidation, Electrolytic)

BOGOYAVLENSKIY, A.F.; BELOV, V.T.; KOZYREV, Ye.M.

Sorption properties of an anodic oxide film on aluminum investigated by the tracer method. Part 2: Effect of the pH of filler solution on the sorption of a phosphate ion by an anodic oxide film on aluminum. Izv.vys.ucheb.zav.;khim.i khim.tekh. 5 no.2: 267-271 '62. (MIRA 15:8)

1. Kazanskiy aviatsionnyy institut, kafedra khimii.
(Phosphates) (Hydrogen-ion concentration) (Sorption)
(Aluminum oxide)

BOGOYAVLENSKIY, A.F.; KOZYREV, Ye.M.; BELOV, V.T.

Investigation of the sorption properties of an anodic oxide film on aluminum by the tracer method. Part 3: Effect of the electrochemical conditions of anodic oxidation of aluminum in a sulfuric acid bath on the sorption characteristics of the oxide film. Izv.vys.ucheb.zav.;khim.i khim.tekh. 5 no.3:423-427 '62. (MIRA 15:7)

1. Kazanskiy aviatsionnyy institut, kafedra khimii.
(Aluminum oxide) (Sorption) (Electrochemistry)

S/080/62/035/007/009/013
D214/D307

AUTHORS: Bogoyavlenskiy, A.F. and Dobrotvorskiy, G.N.

TITLE: The introduction of radioactive isotopes C^{14} and Co^{60} into the anodic oxide film on aluminum

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 7, 1962, 1557-1560

TEXT: The aim of this work was to study the introduction of C^{14} and Co^{60} into the anodic films of Al_2O_3. The anodic oxidation was carried out in Na_2CO_3 solutions containing from 0.0005 to 0.01 mol/l of NH_4 $[Co(NH_3)_2(NO_2)_4]$ (I), and the radioactive elements were introduced as $C^{14}O_3^{2-}$ or $[Co^{60}(NH_3)_2(NO_2)_4]^{1-}$. The films of Al_2O_3 had their β-activity determined. The amount of the complex ion found in the Al_2O_3 film increased with the concentration of I in the electrolyte up to 0.0025 mol/l. while the CO_3^{2-} content

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decreased sharply. At higher concentrations of I in the electrolyte the content of both the anions in the Al_2O_3 film did not change with the concentration of I. The strength of the bond between the anions and Al_2O_3 was found to be greater in the case of the CO_3^{2-}. By washing the Al_2O_3 film with water 35-40% of the activity due to Co^{60} was washed out while the activity due to $C^{14}O_3^{2-}$ remained almost constant. This was explained by assuming that CO_3^{2-} is present only in the structure of the film while 35-40% of the complex anion is adsorbed on the surface. There are 3 figures.

SUBMITTED: January 27, 1961

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